Volume 2 • Issue 1 January 2008

The Stream Line

On Kentucky's State Revolving Fund Program

See inside this issue:

Contact Information

Lola Lyle
Division of Water
14 Reilly Road
Frankfort, KY 40601
502-564-3410, ext. 416
Fax: 502-564-0111
E-mail: lola.lyle@ky.gov
www.water.ky.gov

Sandy Williams
Kentucky Infrastructure Authority
1024 Capital Center Drive
Suite 340
Frankfort, KY 40601
502-573-0260
Fax: 502-573-0157
www.kia.ky.gov

EPA Sustainable Infrastructure Initiative

Aimed at helping to improve the future of water infrastructure

by Shafiq Amawi

Kentucky needs $5 billion* to address its water and wastewater infrastructure needs over the next 20 years. Most of our existing infrastructure was built decades ago and it is nearing the end of its useful life. With waning federal and state financial assistance, local governments must raise the funds needed to upgrade and replace the aging infrastructure in order to maintain the environmental and socioeconomic benefits that result from having reliable and safe water infrastructure.

According to EPA 2002 Infrastructure Gap Analysis Report, the entire nation needs $500 billion to meet its water and wastewater infrastructure needs by year 2020. To bridge the gap between investments and current spending levels and help states and local governments tackle this challenge, EPA has launched the Sustainable Infrastructure (SI) initiative, which is aimed at changing the way the nation views, values, and manages its water infrastructure. The SI initiative is organized around what has been dubbed the Four Pillars of sustainable infrastructure. EPA believes we can drastically reduce the funding gap if state water agencies, local governments and utility managers promote and incorporate the following pillars into their planning, management and operation practices.

Better Utility Management: Sustainable infrastructure needs an effective management approach that ensures compliance with regulatory requirements, controls cost and extends the life-cycle of infrastructure.

Full Cost Pricing: This is where a collaborative effort among the different partners (i.e., EPA, states and locals) is needed to change how the public views, values and manages water infrastructure. It is essential for utilities to develop rate structures that allow them to generate the revenues needed to properly operate and maintain their facilities and avoid huge spikes in water and sewer rates.

Water Efficiency: By cutting back on water consumption, we reduce the wear and tear on both water and wastewater infrastructure and could potentially postpone some treatment plants expansion projects. This pillar could be advanced further by encouraging residential and commercial developers to use water-saving plumbing fixtures in their new developments, as well as urging industrial users to reduce their potable water use by using recycled water to meet their needs when possible.

Watershed Protection: Integrated watershed planning is gaining lots of momentum throughout the nation and proving to be a powerful tool in protecting water supplies. Utility managers are encouraged to incorporate watershed planning into their management and operation practices to reduce cost and restore the quality of impaired waters.

To learn more about the SI initiative and tap the available tools and resources on this topic, you can visit www.epa.gov/waterinfrastructure.

** This estimate is based on water and wastewater needs surveys compiled by Division of Water staff.*

Changes in the Application Process

The Division of Water (DOW) and Kentucky Infrastructure Authority (KIA) have made changes to the application process for the State Revolving Fund (SRF) program. (Please note the *loan application* is different from a *project questionnaire*, which is done early in the process to apply for the project priority list. A loan application is submitted after the project is on the PPL and is eligible for funding. These changes only apply to the loan application.)

- The Environmental Review and approved Plans and Specifications do not have to be completed in order to get a project approved for a loan. However, they must be submitted within three months of receiving a conditional commitment letter, and approved within nine months of receiving a conditional commitment letter. (This timeframe may be different for large clean water projects, such as treatment plants.)
- The conditional commitment letter by the KIA board is only valid for one year.
- Bid tabs and a revised "as-bid" budget are not required before the project goes to the KIA board for approval. If the as-bid budget increases the loan amount needed, the initial approved amount can be increased up to 10 percent before it must go back to the board for another approval.
- Letters of commitment from other funding sources must be received by DOW and KIA prior to releasing funds.
- The completed application should be sent to KIA at the mailing address listed in the "Contact Information" on this page.

The updated application and accompanying information can be found on the KIA Web site at www.kia.ky.gov.

The Stream Line

State of Kentucky

Steven L. Beshear, Governor

Environmental and Public Protection Cabinet

Robert D. Vance, *Secretary*

Department for Environmental Protection

Division of Water

Sandy Gruzesky,

Assistant Director

The Stream Line is published quarterly by the Division of Water with state and federal funds. Write the Division of Water, RPPS, 14 Reilly Road, Frankfort, KY 40601 to have your name and e-mail address added to the mailing list or call 502-564-3410, ext. 540, fax your request to 502-564-0111 or e-mail alison.simpson@ky.gov.

Highlights of the SRF Year 2007

The SRF Year 2007 ended June 30, 2007. Listed below are highlights of each program's accomplishments and short-term goals. *(Taken from the Annual Report dated Sept. 28, 2007.)*

The Clean Water State Revolving Fund (CWSRF)

In FY2007, Kentucky made 10 binding commitments totaling $46,285,278. Total disbursements from the SRF to various recipients and for program administration for FY2007 totaled $51,802,312.

In addition, the CWSRF made significant strides toward its short– and long- term goals.

Short-term goals included:

1. Develop and implement an Integrated Project Priority Ranking System (IPPRS) to prioritize water pollution control projects and activities.

Kentucky developed an IPPRS and used it to formulate the 2007 Project Priority List (PPL) and Intended Use Plan (IUP).

2. Improve the pace at which available funds are loaned.

Projects on the 2007 PPL/IUP included over $400 million of potential CWSRF loans. DOW and KIA meet monthly to review the status of potential projects and discuss marketing activities to speed up the process.

3. Solicit nonpoint source projects to address some of the state's high-priority water quality problems.

Kentucky's nonpoint source staff was involved in developing the ranking system and evaluating projects for the 2007 PPL and future projects as well.

4. Update the online CWSRF Benefits Reporting System to provide environmental benefits of funded projects.

All projects resulted in environmental benefits and water quality improvements and have been included in the online Benefits Reporting System.

The Drinking Water State Revolving Fund (DWSRF)

In FY2007, Kentucky made four binding commitments totaling $7,150,000. Total available funds for construction during SFY 2007 were $19,146,299. For the remaining $12 million, commitments are expected by June 2008.

The program also made significant progress toward achieving its short- and long-term goals. Short-term goals included:

1. Develop specific environmental outcomes and measures by category type to demonstrate public health benefits.

All projects resulted in environmental benefits and public health improvements. Specific outcomes and measures by category type are being designed.

2. Revise loan requirements to eliminate unnecessary paperwork and increase public interest in the program.

The program continues to be streamlined for greater efficiency. DOW and KIA meet monthly to review status of potential projects and discuss marketing activities to speed up the process.

3. Issue and evaluate contracts associated with set-aside initiatives.

The program provided funding to the Kentucky Rural Water Association (KRWA) to provide Small Systems' Technical Assistance services to Kentucky's small systems. A Utility Optimization/Assessment Program (UOP) was developed to help with technical, financial, and managerial capacity and planning assistance, as well as an electronic means for evaluating water systems. Under this program, 10 small systems were analyzed and assisted.

4. Continue to provide funds to improve drinking water and infrastructure.

Four binding commitments totaling 7,150,000 were issued in 2007. The number of projects funded was low due to delays experienced by projects at the top of the priority list. In the past eight years, Kentucky has issued 48 binding commitments totaling $100,275,719.

5. Maintain an efficient program that can offer low-cost financing.

The average interest rate to borrowers for FY2007 was 2.61 percent. In addition, all projects must undergo a technical, environmental and financial review, demonstrate capacity, and be in compliance with the Safe Drinking Water Act (SDWA).

6. Direct resources to the state's most pressing compliance and health needs and support components of the state drinking water and ground water programs.

Kentucky provided funding from the set-asides for DWSRF administration, small systems technical assistance, state program management, and state and local assistance. Kentucky continues to evaluate their strategy for assisting public water systems (PWS) and provide technical assistance to PWSs that serve fewer than 10,000 people.

Who To Contact With Questions

For Financial Questions:
• Sandy Williams, KIA
502-573-0260
sandy.williams@ky.gov

• Lola Lyle, DOW RPPS
502-564-3410, ext. 416
lola.lyle@ky.gov

For Clean Water Questions:
Environmental Review
• Jill Bertelson, DOW FCB
502-564-3410, ext. 596
jill.bertelson@ky.gov

Technical
For construction permits
• Hossein Mehdipour, DOW FCB
502-564-3410, ext. 548
hossein.mehidpour@ky.gov

For WWTP Wasteload Allocations
• Courtney Seitz, DOW KPDES
502-564-3410, ext. 465
courtney.seitz@ky.gov

For WWTP Discharge Permits
• Larry Sowder, DOW KPDES
502-564-3410, ext. 472
larry.sowder@ky.gov

For Drinking Water Questions:
SRF Coordination and Environmental Review
• Amanda Yeary
502-564-3410, ext. 547
amanda.yeary@ky.gov

• Leslie Harp
502-564-3410, ext. 591
leslie.harp@ky.gov

Technical Plans and Specs
• Mike Riley
502-564-3410, ext. 592
jmike.riley@ky.gov

Community Spotlight: Hardinsburg, Ky.

Hardinsburg water treatment plant on the cutting edge

By Allison Fleck

Surrounded by open fields near the banks of the Ohio River in Breckinridge County is a long, low barn-like structure flanked by a "silo." The cross buck door designs enhance the building's rural charm. Small bushes strategically planted around the "barn" will eventually create green barriers to further disguise the building's innocuous appearance.

Welcome to the City of Hardinsburg's new $14 million water treatment facility and distribution system, which celebrated its official opening Sept. 6 but has been in operation since June 1. Designed to blend into the countryside for aesthetic and security reasons, the agrarian structure houses the first municipally-owned reverse osmosis (RO) facility in the state of Kentucky.

Nearly eight years ago, the city of Hardinsburg took its first step toward making a commitment to its customers to build a state-of-the-art water treatment facility to provide a reliable water supply for the 19,000 residents of Breckinridge County and prepare the county for future growth.

Problems with the existing conventional rapid sand filter plant, which drew water from Tules Creek, a tributary of Rough River Reservoir, had plagued the system for years. Siltation, combined with low water levels during winter months, caused chronic clogging of the raw water intake. Underwater surveys and soundings of the area indicated a significant silting of the lower intake channel.

The city decided in 2001 to relocate the water treatment plant to the alluvium fields along the Ohio River in the northeast part of the county to tap into the abundant local groundwater as its raw water source. Unfortunately, the ground water contained high levels of hardness and nitrates. Despite this problem, the city persisted in its decision. They were weary of the problems associated with siltation, capacity and disinfection by-products compliance.

After studying various treatment technologies, city officials chose low-pressure reverse osmosis (LPRO), which would remove in one treatment process the high levels of hardness and nitrates found in the groundwater. They worked closely with the Division of Water to meet permitting requirements, arrange financing and obtain expertise.

Solitha Dharman, an engineer in the Drinking Water Branch who was involved in the eight-year planning, design and construction process, said the city selected the best option for its needs.

"While a system treating surface water would have been less expensive in the short run, keeping up with changing regulatory requirements can be become expensive and complicated in the long run," said Dharman. "The beauty of groundwater is that natural filtration may remove most of the turbidity in the surface water, where pathogens are most likely to attach. The DOW Groundwater Branch performed hydrologic tests to ensure that the location of the wells near the Ohio River would provide a reliable quantity of source groundwater."

Photo Credit: O'Brien & Gere

Inside the new plant

Reverse osmosis is a separation process that uses pressure to force a solvent through a semipermeable membrane that retains the solute on one side and allows the pure solvent (water) to pass to the other side. Normal osmosis is the natural movement of solvent from an area of low solute concentration, through a membrane, to an area of high solute concentration when no external pressure is applied.

The well field at the facility consists of two 115-foot wells with a design capacity of 800 gallons per minute. The raw water is pretreated with sulfuric acid. This lowers the pH level and keeps the calcium carbonate in soluble form so that the RO membranes can remove it from the water. It is calcium carbonate scaling that causes hardness in water..

The raw water is also filtered through micron cartridge filters to remove particulates (silt and sand) that could damage the RO feed pumps and membranes.

The pretreated raw water is then fed directly to the RO membrane filters, which removes more than 90 percent of the hardness and approximately 80 percent of the nitrates. The membranes also remove many naturally occurring organics and other contaminants that may be present in the raw water.

In an ironic twist, treated water comes out a little too pure. "Because the process of reverse osmosis removes virtually all the mineral content from the water, some untreated groundwater is blended into the finished water to restore taste and nutrients," said Dharman. "This makes the water more palatable and more beneficial for consumption."

The next stop for the blended water is the degasifier/air stripping tower to remove the carbon dioxide which forms when the sulfuric acid is added to the pretreated water. If not removed, the aggressive, bubbly permeate could cause corrosion in the distribution system and milkiness in the water. The treated water is then transferred to the ground storage tank.

In the post-treatment phase, chemicals are added to the treated water to disinfect and destroy any disease-causing organisms, such as bacteria and viruses, and to help reduce the corrosivity of the water. Fluoride is also added to inhibit dental problems in the community.

Wastewater from the plant is diffused into the Ohio River under a Kentucky Pollutant Discharge Elimination System permit.

Project manager David Wakefield said public response to the new plant has been "nothing but positive."

"We definitely did a lot of research about RO and visited sites in other states," said Wakefield. "I think the general consensus was we wanted off Rough River and not on the Ohio River. Except for the hardness and nitrates, the groundwater was a very good source."

Bryan Lovan, project manager with O'Brien & Gere, which designed the facility, said public response to the renewed water quality has been particularly gratifying.

"After the plant was put on line, customers were calling in enthused about the taste," said Lovan. "One lady said her children now choose tap water over bottled water. Another said even the coffee and tea tastes better. Hardinsburg and Breckinridge County should be set for abundant, high-quality water for many years to come."

Dharman said the Hardinsburg water treatment plant project is one he will never forget.

"This is the most significant project I've ever done and may ever do as an engineer with the Division of Water," he said. "It's rare that you get to start at the earliest planning stages, work for years with the local officials and consulting engineers and eventually get to see the finished product. It has been personally very satisfying."

Photo Credit: O'Brien & Gere

The plant's exterior

ABOUT THE PROJECT

The $14 million Hardinsburg plant is a 2.0 million gallons per day (MGD) treatment facility, expandable to 3.3 MGD. It provides water to14,790 of the 19,000 residents in Breckinridge County and sells water to the city of Irvington. Plans are underway to extend service to the remaining county residents.

Construction began in January 2006 and was completed in June 2007. The plant was financed using low-interest loans through Kentucky's Drinking Water State Revolving Fund and U.S. Department of Agricultural (USDA) Rural Development programs. The city also received multiple grants from USDA Rural Development, the Governor's Office for Local Development and U.S. Environmental Protection Agency Special Appropriations.

PLANT MONITORING AND CONTROL

A plant-side supervisory control and data acquisition system provides real-time process control data to the operators to facilitate prompt decisionmaking, automated operations and efficient record keeping. All major processes and equipment are monitored for mode of operation and equipment failure. Customized applications software is used to monitor status, control process equipment, initiate alarms and create operating reports. For security reasons, access to the main treatment building is restricted.

News You Can Use

2009 PPL/IUP Update

The Call for Projects period for both Drinking Water and Clean Water has ended. DOW and KIA are now in the process of determining the Project Priority List (PPL) and Intended Use Plan (IUP) for the state fiscal year 2009, which is July 1, 2008 through June 30, 2009.

After the PPL/IUP is determined and a draft is created, there will be a public comment period. Watch the DOW Web site for more information.

DWSRF Informational Meetings

On Jan. 17-18, 2008, representatives from DOW and KIA will meet with DWSRF applicants to review the program requirements and deadlines. These meetings are by appointment and are for those who have already been invited to apply. The meetings will be held at Kentucky Infrastructure Authority (KIA) which is located in Frankfort at 1024 Capital Center Drive, Suite 340. More details about the meetings will be forthcoming.

A Fall 2008 training session is in the planning stages as well. This training session will be open to anyone interested in knowing more about the program benefits and requirements. More information about the fall training session will be available soon.

Did you know about FACT?

The Financing Alternatives Comparison Tool (FACT) is a financial analysis tool that helps identify the most cost-effective method to fund a wastewater or drinking water management project. This tool produces a comprehensive analysis that compares various financing options for these projects by incorporating financing, regulatory and other important costs.

FACT creates a variety of useful reports to effectively communicate the results of a comprehensive analysis. A summary report is provided, which compares various financing options using key financial figures. This tool can also create graphical comparisons of annual and total costs of various financing options over time. FACT will aid municipalities, utilities and environmental organizations in selecting the best financing option to fund their water quality and drinking water projects.

To install and use FACT, or for more information about the tool, go to EPA's Web site at http://www.epa.gov/owm/cwfinance/cwsrf/fact.htm.

Have an idea or suggestion for a future issue of the *Stream Line*? Send them to Lola Lyle at lola.lyle@ky.gov or Alison Simpson at alison.simpson@ky.gov.

Upcoming Clean Watershed Needs Survey 2008

The Division of Water (DOW) is preparing to conduct the Clean Watersheds Needs Survey (CWNS) 2008, with data entry by state and local users from Jan. - Oct. 2008 and data review by EPA from Nov. 2008 - Feb. 2009. The CWNS is conducted every four years by EPA, in partnership with the states, in response to Sections 205(a) and 516 of the Clean Water Act. EPA uses this information to prepare a report to Congress to support future Clean Water State Revolving Fund appropriations and to support its sustainable infrastructure initiative (see article on page one).

The CWNS collects information about facilities and needs for:

- Publicly-owned wastewater collection and treatment facilities
- Stormwater and combined sewer overflows control facilities
- Nonpoint source pollution control projects
- Decentralized wastewater management
- Estuary management projects

Some changes for the 2008 survey include:

- Allowing local communities to submit information directly into the CWNS data entry system
- Moving the CWNS data entry system to the Internet to enable state and local users to submit data electronically
- Integrating CWNS data with other EPA programs
- Improving cost curves for estimating on-site and decentralized treatment systems and developing new cost curves for new sewers and sewer rehabilitation/replacement
- Improving rules and review methods for documentation of the wastewater needs

DOW staff will begin contacting communities in early 2008 to request information. See EPA's CWNS Web site http://www.epa.gov/cwns/ or contact Kentucky's CWNS State Coordinator, Jill Bertelson, at 502-564-3410 ext. 596 or jill.bertelson@ky.gov for more information.